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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,989	11/24/2003	Uwe Hoffmann	19232.0012U1	3382
23859	7590	06/13/2005	EXAMINER	
NEEDLE & ROSENBERG, P.C. SUITE 1000 999 PEACHTREE STREET ATLANTA, GA 30309-3915			BUEKER, RICHARD R	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/720,989

Applicant(s)

HOFFMANN ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-12 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/08/04.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi (JP 2001 192293) taken in view of Nichol (3,603,285), Cole (3,867,183), Witzman (6,202,591) and Goldstein (5,321,260). Nakabayashi discloses (see Figs. 3-8, for example) a vapor source for supplying vapor in a lateral direction. Nakabayashi's vapor source includes a crucible and nozzle pipe, each having separate heaters and thermocouples for separate temperature control. Nakabayashi does not teach that the nozzle pipe and crucible are separate parts with the nozzle pipe "placed from above the melting crucible" as recited in claim 1. Nichol (see the Fig. and col. 2, lines 65-67), Cole (see Fig. 3 and col. 3, lines 65-68), Witzman (col. 8, lines 20-22) and Goldstein (see the Fig) all disclose vapor sources having a crucible with a nozzle pipe mounted on top of the crucible, and they all teach that the nozzle pipe can be formed as a separate part and connected to the top of the crucible. It would have been prima facie obvious to one skilled in the art to form the crucible and nozzle pipe of separate parts and connect them together, because Nichol, Cole, Witzman and Goldstein all teach that a vapor source of the type disclosed by Nakabayashi can successfully be constructed by providing a nozzle pipe and crucible as separate parts and interconnecting the two parts.

Claims 5-6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi (JP 2001 192293) taken in view of Nichol (3,603,285), Cole (3,867,183), Witzman (6,202,591) and Goldstein (5,321,260) for the reasons stated above, taken in further view of Streetman (5,034,604). Nakabayashi teaches the use of a heat reflecting heat shield (see element 105 of Fig. 5) surrounded by a housing with

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cooling pipes on the outside. Nakabayashi does not discuss using multiple reflectors as his heat shield. Streetman (see Fig. 1c and col. 7, lines 20-35), however, teaches that a heat shield surrounding a vapor source crucible can desirably be formed from plural layers of heat reflectors. It would have been obvious to one skilled in the art to use multiple reflectors as the heat shield of Nakabayashi because Streetman teaches that it is desirable to provide multiple heat reflective layers as a heat shield for a vapor source crucible. It is noted also that Witzman (see Fig. 1A) also teaches the use of plural heat reflectors for a crucible heat shield.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakabayashi (JP 2001 192293) taken in view of Nichol (3,603,285), Cole (3,867,183), Witzman (6,202,591) and Goldstein (5,321,260) for the reasons stated above, taken in further view of Streetman (5,034,604) for the reasons stated in the rejection of claims 5 and 6 above, taken in further view of Ingram (5,740,858) (see Fig. 1, for example), who teaches the use of a cooling pipe having a serpentine or meander shape for uniformly cooling a surface. This is a common and well-known shape for cooling pipes when uniform cooling of an extended area is desired. It would have been prima facie obvious to use this shape on a nozzle pipe housing to uniformly cool the housing. It is noted again that Nakabayashi teaches the desirability of providing a cooled housing around a nozzle pipe.

Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591). Witzman's Fig. 14A vapor source (see col. 15, lines 24-38) includes a crucible with a nozzle pipe (chimney) mounted on top of the crucible. The

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nozzle pipe deflects vapor from the crucible into a horizontal direction and delivers the vapor to a vertically aligned substrate. Regarding the construction of Witzman's vapor source, Witzman teaches (see Figs. 3A, and col. 8, lines 1-35, for example) that a nozzle pipe chimney distributor can successfully be attached to a crucible by placing it from above so that it forms a seal on the top of the crucible. It would have been obvious to one skilled in the art to mount the chimney of Witzman's Fig. 14A in the manner described by Witzman at col. 8, lines 1-35. Regarding claim 9, the screen 474 of Fig. 14A of Witzman includes holes that meet the claim 9 limitation of a nozzle pipe vapor outlet formed by multiple holes positioned one over another.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) in view of Nakabayashi (JP 2001 192293). Nakabayashi (see Fig. 8 and page 11, lines 3-20) discloses a vapor source having a crucible with a nozzle pipe located thereon. A separate heater is provided for each of the crucible and the nozzle pipe. The heaters are provided for the same purpose as the heaters of Witzman. The crucible heater vaporizes the coating material, and the nozzle pipe heater prevents condensation of the coating vapor with the nozzle pipe. Nakabayashi teaches that it is desirable to provide a first thermocouple to control the crucible heater, and a second thermocouple to control the nozzle pipe heater. It would have been obvious to one skilled in the art to provide the Fig. 14A vapor source of Witzman with separate heaters and separate thermocouples to desirably improve the temperature control of the vapor source.

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) taken in view of Goldstein (5,321,260). Goldstein teaches (see the Fig. and col. 4, lines 25-27) the use of a tapered diameter joint to connect a crucible with a nozzle pipe. It would have been obvious to one skilled in the art to use a diameter taper to connect the chimney and crucible of Witzman because Goldstein teaches that a seal of sufficient degree can be successfully formed between a crucible and nozzle pipe using a tapered diameter joint.

Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) taken in view of Makino (3,417,733) and in view of Pundsack (3,971,334) or Timmons (2002/0078894). Makino (Figs. 1-3) discloses a vapor source having a nozzle pipe 1, which has nozzle holes on its side to direct vapor laterally onto vertically aligned substrate surfaces to be coated. Makino teaches (col. 3, lines 46-75 and col. 4, lines 60-64) that it is desirable to provide a truncated cone shape (see element 2 of Figs. 1-3) having a coaxial filling opening at the top of the nozzle pipe. It would have been obvious to one skilled in the art to provide such a fill opening in the top of Witzman's nozzle pipe in the manner taught by Makino, to provide greater convenience of filling vaporizable material into the vapor source. Regarding the claimed truncated cone shape, Makino teaches that this shape can successfully be used, and it is considered prima facie obvious to use this shape in Witzman's vapor source, at least to the extent presently claimed. Makino intends his filling opening to be closed (col. 4, lines 60-64) by some closure element, but does not discuss what type of closure element he uses to close his inlet hole 2. Pundsack (see col. 3, lines 60-64 and

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Fig. 2, element 47) and Timmons (para. 9 and Figs. 1 and 2) both disclose vaporizers in which fill plugs are used to close fill ports. It is noted that “plunger” is defined as “a person or thing that plunges”, while “plunge” is defined as to cast or thrust forcibly or suddenly into something”. A fill plug includes a plug portion that thrusts into a fill port by force, and therefore can properly be considered to be a plunger.

Claims 5, 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) in view of Remondiere (4,880,960) and Nakabayashi (JP 2001 192293). Witzman (Figs. 1A and 3A) teaches the step of providing heat reflectors such as molybdenum heat shield 86 of Fig. 3A around a vapor source. The heat reflector is enclosed in a water-cooled copper vaporizer housing 90 that is cooled by cooling pipes 92. Fig. 3A of Witzman shows that the reflector and cooled housing are arranged around the heated nozzle pipe chimney 66 to properly maintain the temperature of the heated nozzle pipe. Nakabayashi (Figs. 5 and 8) also teaches the use of a reflector and cooled housing around a nozzle pipe chimney for improved thermal control. The nozzle pipe of Witzman's Fig. 14A is heated to a high temperature in the same manner as the nozzle pipe of Fig. 3A, and it would have been obvious to one skilled in the art to provide it with the same type of thermal shield as in Fig. 3A of Witzman or Nakabayashi. Also, Remondiere (Fig. 1) teaches the use of heat radiation reflectors around a nozzle pipe, and he makes clear that a vapor passage window should be provided in the reflectors at the location of a lateral vapor outlet. It would have been obvious to provide such reflector openings in a reflector around Witzman's Fig. 14A lateral vapor outlet in view of the teachings of Remondiere.

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Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) in view of Remondiere (4,880,960) and Nakabayashi (JP 2001 192293) for the reasons stated in the rejection of claims 5 and 6 above, taken in further view of Ingram (5,740,858) (see Fig. 1, for example), who teaches the use of a cooling pipe having a serpentine or meander shape for uniformly cooling a surface. This is a common and well-known shape for cooling pipes when uniform cooling of an extended area is desired. It would have been prima facie obvious to use this shape on a nozzle pipe housing to uniformly cool the housing. It is noted again that Nakabayashi teaches the desirability of providing a cooled housing around a nozzle pipe.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) taken in view of Makino (3,417,733), Baxter (5,803,976) (see Fig. 5) and/or Van Slyke (2003/0015140) (Figs. 5 and 6, for example), each of whom teaches the use of multiple outlet holes for uniformly distributing vapor from a vapor source. It would have been obvious to one skilled in the art to utilize plural holes as the vapor outlet of Fig. 14A of Witzman, in view of the teachings of Makino, Baxter and/or Van Slyke that a line of holes provides desirably uniform vapor distribution.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witzman (6,202,591) taken in view of Ney (4,412,508) (abstract) or Mattord (6,011,904) (col. 3, lines 10-17), who teach that graphite can successfully be used as a refractory material of construction for a crucible and nozzle pipe of a vapor source. It would have been obvious to one skilled in the art to utilize graphite as the refractory material of

construction of Witzman because the secondary references teach that graphite can successfully be used as a vapor source material of construction.

Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Cornelius (3,661,117). Cornelius (Figs. 1 and 2) discloses a crucible with a capillary tube mounted on top for vapor deposition of materials such as metals (col. 1, line 25). The crucible and capillary tube have separate heaters as claimed. The capillary tube of Cornelius is inherently a nozzle pipe as claimed by claim 1, or at least obviously could be a nozzle pipe.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cornelius taken in view of Ney (4,412,508). Cornelius teaches (col. 3, lines 19-20) that his crucible can be made of a refractory material such as carbon. Cornelius also teaches that his nozzle pipe is made of a refractory material (col. 3, lines 29-30). Cornelius does not specifically state that the carbon can be graphite. Ney (abstract), however, teaches that it is desirable to use graphite as a material of construction for a vapor source to be used for vapor deposition of metals such as gold. It would have been obvious to one skilled in the art to use graphite as the refractory material of construction for Cornelius' crucible and nozzle pipe, because Ney teaches that graphite can successfully be used for depositing metals as desired by Cornelius.

Applicants' arguments have been considered but are not persuasive.

Claim 1 has been amended to recite "the nozzle pipe comprising: a top that is sealable". This limitation is a recitation of intended use, and the nozzle pipes of the cited references are all potentially "sealable" in some manner or to some extent. Any of

these prior art nozzle pipes could be placed inside a sealed sleeve or sealed container. The claim 1 recitation of a nozzle pipe that is sealable does not require the presence of a seal.

It is noted also that "top" is defined as the "upper part, surface, etc. of anything" and "a covering or lid". Since the nozzle pipe of the cited references (such as Witzman or Cole) is positioned on top of the crucible and is the upper part of the vaporizer assembly, then the nozzle pipe 'comprises a top' that is placed in sealing relationship with the crucible and thus is sealable as recited.

Applicants have argued that none of the references disclose a nozzle pipe with a horizontal vapor outlet in its lateral surface. It is noted, however, that the nozzle pipe outlets of Nakabayashi's Figs. 1-9 all point in a horizontal direction, which is what applicants Figs. 1 and 2 all illustrate. Applicants have argued that Nakabayashi's nozzle pipe is bent in order to change direction of the vapor. It is noted, however, that the apparatus does have vapor flowing out of the crucible as claimed, and it does have a nozzle pipe for deflecting the vapor horizontally as claimed, and it does have its vapor outlet in a lateral surface of the nozzle pipe as claimed.

Applicants have argued that the chimney of Witzman has a vapor outlet on its top for a vertically aligned substrate. It is noted, however, that Fig. 14A of Witzman illustrates a chimney having a vapor outlet in its lateral surface that directs the vapor in a horizontal path toward a substrate to be coated.

Regarding Cornelius, the capillary tube can be considered a pipe. Also, its outlet is in a lateral surface of the pipe, both in the Fig. 1 embodiment and in the Fig. 2 embodiment of Cornelius.

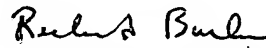
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard Bueker
Primary Examiner
Art Unit 1763